When in America, do as the Americans? Exploring the heterogeneity in immigrants unhealthy assimilation

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Exploring the heterogeneity in immigrants unhealthy assimilation

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Abstract

It is a well-established result that immigrants upon their arrival in the United States are in better health condition with respect to their American counterpart and that such advantage erodes over time. In this paper, following Giuntella and Stella (2016), we intend to study if such assimilation might be heterogeneous not only for different arrival cohorts but also for different unhealthy behaviors. To do so we focus on the assimilation of two unhealthy behaviors: binge drinking and cigarette consumption. For binge drinking we show that more recent immigrant cohorts arrive in the US with a higher probability of being binge drinker and experience a faster assimilation in terms of increased consumption of alcohol and an increase in the probability of consuming alcohol over daily guideline. On the contrary smoking assimilation is less pronounced. Both earlier and later arrival cohorts report lower smoking rates, although such health advantage decreases with time spent in the US. These results shows that there is indeed heterogeneity in the assimilation of unhealthy behaviors for American immigrants, which are more at risk of assimilating alcohol consumption rather than smoking habits from natives.

Keywords: health immigration effects, unhealthy assimilation

JEL-Classification: J15, I10

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1 Introduction

Although immigrants in the United States are still relatively small in absolute term, representing roughly 12.5% of the entire population (Grieco et al., 2012), they are growing far more rapidly than the native-born population. According to Kandel (2011) *"between 2000 and 2008, the foreign born contributed 30% of the total U.S. population increase and almost all of the prime 25-54 working age group increase"*. This large and increasing presence of immigrants highlights the importance of monitoring, among other measures, their health condition. A large immigrant population may increase the pressure to the health care system, for example, related to specific health care needs connected to immigrants' cultural heritage and habits (Borjas and Hilton, 1995, Romero-Ortuno, 2004).

When considering the primary impact of immigration on health care there is a wide spread public view such that immigrants are frequently blamed to raise health care costs and to represents an increased burden on the health care system, especially on native taxpayers. However, empirical evidence shows that immigrants, upon arriving in the US, are younger and healthier than their American counterparts and less likely to utilize health care (Goldman et al., 2006). Such evidence is conventionally defined as *"health immigrant effect"*. Interestingly upon their arrival immigrants, are healthier than both their population of origin and natives in the host countries, but their health deteriorates as they spend time in the hosting country (Akbulut-Yuksel and Kugler, 2016, Antecol and Bedard, 2006). For example, (Akbulut-Yuksel and Kugler, 2016) show that even if immigrant children inherit a prominent fraction of their health status (e.g. body weight, asthma, depression) from their parents, the longer they remain in the US the more their health status is similar to the one of native children. Such assimilation is observed for several countries and across numerous health indicators (Antecol and Bedard, 2006, Kennedy et al., 2006). The existing literature provides evidence that the relative advantage that immigrants exhibit upon arriving is due to self-selection and socio-cultural protection (Antecol and Bedard, 2006, Jass and Massey, 2004, McDonald and Kennedy, 2004, Riosmena et al., 2013). Unfortunately, we still know very little about the process of unhealthy assimilation and its heterogeneity across different immigrant cohorts. Shedding light on such pattern is crucial to evaluate the costs and benefits of migration, and, in particular, its impact on health care.

One of the few papers that examined immigrant health assimilation and its possible heterogeneity across different arrival cohorts is Giuntella and Stella (2016), by applying an empirical methodology similar to the wage convergence literature (Borjas, 2015). In their paper, Giuntella and Stella (2016) focused their analysis on the spread of obesity among US immigrants. We intend to build upon such contributions and to study if such assimilation might be heterogeneous across different health behaviors. Therefore we focus our analysis on the health immigration effect for American immigrant of drinking and smoking habits.

As in Giuntella and Stella (2016) to do so we use data from the public version of the Integrated Health Interview Survey (IHIS) from 1989-2014, to study cohort differences in the assimilation of binge drinking and cigarettes consumption among immigrants over time living in the US. We find that there are indeed cohort effects for alcohol consumption, with more recent cohorts having relatively higher rates of drinking habits and daily drinks consumes upon arrival. The results show that such assimilation increased for cohorts

arriving in the 1990s. Before 1990, immigrant could expect an increase in their relative binge drinking status of approximately $3-4\%$, during the first 10 years in the US; while such assimilation effect increased to 5% for immigrants who arrived after the 1990, with a more pronounced increased for male and Hispanic immigrants. In terms of number of drinks, later cohorts exhibit a higher daily consumption of alcoholic beverages; however, the rate of assimilation was higher for cohorts arriving in the first half of the 1990s. Such results point out to a pattern such that, on average, immigrants tend to have a higher probability of becoming binge drinker the longer they stay in the US, but consuming fewer drinks than natives do. The results on smoking habits point to an interesting pattern, which contradicts the "health immigrant effect". Immigrants maintained and actually increased their relative advantages in terms of lower smoking rates and daily cigarettes consumption once upon arriving in the US. In terms of assimilation, however, the results shows that over time immigrants are catching up with natives. In fact, immigrant in the 1990s could expect a decrease in their relative smoking status of approximately $6-8\%$, during the first 10 years in the US, however such divergence rate more than halved (2%) for immigrants who arrived after the 2000, for Hispanic and male immigrant this reduction was more pronounced. These results confirm that the dynamics of assimilation between drinking and smoking rates are different. The convergence towards American drinking habits seems to start in the home countries, since immigrants relative drinking habits advantage is decreasing over-time, and continues the longer they stay in the US; while for smoking habits immigrants' relative advantage is present and stronger over-time as they leave their home countries, however the longer they stay in the US the more they are influenced by natives' smoking habits.

2 A model of health assimilation

In this section we provide a sketched model of how individual might be affected by different social references, in their consumption habits. To do so we build upon the model of Reich and Weibull (2012) and define an economy composed by n individuals (with $i \in I\{1, ..., n\}$) and m goods (with $k \in K = \{1, ..., m\}$). For simplicity we assume that there exists just two goods and so each individual chooses a consumption pattern $x_i = (x_{i1}, x_{i2})$ from his budget constraint

$$B(p, y_i) = \left\{ x_i \in \mathbb{R}^m_+ : p_1 x_{i1} + p_2 x_{i2} \leq y_1 \right\} \tag{1}$$

where y_i is the (current) disposable income. Individual health, h_i, is determined by his consumption pattern and by his health dynamics, $h_i = f_i(x_i)$, which is assumed to be exogenously given to the individual. The vectors $\mathbf{x} = (x_1, ..., x_n)$ and $\mathbf{h} = (h_1, ..., h_n)$ (where $h_j = f_j(h_j)\ \forall j$) are called the population consumption and health profile, respectively.

An individual can influence his health by choosing a consumption pattern according to the following utility function

$$U_i(\mathbf{x}) = \ln u_i(x_i) + \beta_i v_i(\mathbf{h}) \tag{2}$$

where $u_i(x_i)$ is the utility from consumption, representing pure consumption enjoyment; while $v_i(\mathbf{h})$ is the component of the utility function describing the individual's i satisfaction with his own health, depending on his own and other's health. This second component of the utility function can be interpreted as health concern, with β_i as the relative weight of such concern. We assume that u_i and v_i are continuous, that u_i is strictly quasi-concave and strictly increasing in all the x; and that for any given $\mathbf{h}$, v_i is strictly quasi-concave in h_i with an unique maximum point representing individual's i ideal health, $\mu_i(\mathbf{h}_{-i})$. The individual unconstrained consumption is the consumption resulting by maximizing u_i if he had no health concerns. Such level result in the individual unconcerned health status, h_i^o, which is defined by $h_i^o = f_i(x_i^o)$ such that $x_1^o \in \max\ u_i(x_i)$.

We characterize individual health accumulation as follows

$$h_i = f_i(x_i) = \theta_{i1}x_{i1} + \theta_{i2}x_{i2} - e_i \tag{3}$$

where: $\theta_{ik} > 0$ if the consumption of good k is health-increasing, $\theta_{ik} < 0$ if the consumption of good k is health decreasing and $\theta_{ik} = 0$ if it has no health effect. In our specific example we assume for simplicity that good 1 is health-decreasing (unhealthy consumption i.e. smoking and/or alcohol consumption) and good 2 has no health effects.[1].

Regarding health concerns we assume the following quadratic loss function

$$v_i(\mathbf{h}) = -\frac{\sigma_i(\mathbf{h}_{-i})(h_i - \mu_i(\mathbf{h}_{-i}))^2}{2} \tag{4}$$

where σ_i and μ_i are positive and continuous functions of others' health, $\mathbf{h}_{-i}$. In this way σ_i reflects how fast the individual's satisfaction with his own health decreases as her actual health deviates from its ideal one. Thus σ_i can be also referred as health sensitivity parameter, which like μ_i is allowed to depend on others' health. A moderate health increase for individual with health close to their ideal creates a little effect on their utility but then the effect picks up as health deviates further from the ideal one to finally decrease as health deviates very far from the ideal.

The utility function part associated with consumption is assumed to exhibits constant elasticity of substitution (CES)

$$u_i(x_i) = (\alpha_{i1}x_{i1}^{\rho_i} + \alpha_{i2}x_{i2}^{\rho_i})^{1/\rho_i} \tag{5}$$

with $\rho_i < 1$ and $\alpha_{i1} + \alpha_{i2} = 1$. Each α parameter represents the intensity of individual desire to consume each good, while ρ_i is the degree of substitutability between them.

The utility function, combining all equations above, becomes

$$U_i(\mathbf{x}) = \frac{1}{\rho_i} ln(\alpha_{i1}x_{i1}^{\rho_i} + \alpha_{i2}x_{i2}^{\rho_i}) - \frac{\beta_i\sigma_i(\mathbf{h}_{-i})}{2}(\theta_{i1}x_{i1} - e_i - \mu_i(\mathbf{h}_{-i}))^2 \tag{6}$$

[1]See Reich and Weibull (2012) for a generalization of this model to more than two consumption goods.

In order to model the *health assimilation* we will assume that the more the individual's reference deviate from his individual ideal health, the less the individual will be concerned by his own deviation for his ideal health. Such that if a person is surrounded by individuals with lower health the less he will be concerned with the consequences of having a health lower than his own ideal one. Formally let individual health sensitivity, σ_i to depend on others health as follows

$$\sigma_i(\mathbf{h}_{-i}) = (1-\gamma_i)\sigma_i^o + \gamma_i e^{-\kappa(h_j-\mu_i)^2/2} \tag{7}$$

where the first term, $\sigma_i^o \geq 0$ is the i's basic sensitivity to own health while the second term represents peer effect and is decreasing as the health of i's reference peers deviates further from i's ideal, with κ representing i's sensitivity to this deviation.

Under this endogeneization the utility function becomes

$$U_i(\mathbf{x}) = \frac{1}{\rho_i} ln(\alpha_{i1}x_{i1}^{\rho_i} + \alpha_{i2}x_{i2}^{\rho_i}) - \beta_i \frac{(1-\gamma_i)\sigma_i^o + \gamma_i e^{-\kappa(h_j-\mu_i)^2/2}}{2}(\theta_{i1}x_{i1} - e - \mu_i))^2 \tag{8}$$

Dividing the first-order condition for each of the two goods and substituting for the budget constraint gives the first order condition in only one variable, namely the health-decreasing good

$$\begin{aligned} &\frac{\alpha_{i1}}{\alpha_{i2}}[1-\beta_1(1-\gamma_i)\sigma_i^o + \gamma_i e^{-\kappa(h_j-\mu_i)^2/2}(\theta_{i1}x_{i1} - e_i - \mu_i)\theta_{i1}x_{i1}]\left(\frac{y_i - p_i x_{i1}}{p_2 x_{i1}}\right)^{1-\rho_i} \\ &= \frac{p_1}{p_2} + \beta_i(1-\gamma_i)\sigma_i^o + \gamma_i e^{-\kappa(h_j-\mu_i)^2/2}\theta_{i1}(\theta_{i1}x_{i1} - e_i - \mu_i)\cdot\frac{y_i - p_1 x_{i1}}{p_2} \end{aligned} \tag{9}$$

The unique solution when the individual has no concern for health, $\sigma_1 = 0$, is x_{i1}^o, which is the individual unconcerned consumption with corresponding health $h_1^o = \theta_{i1}x_{i1} - e_i$.

In equilibrium for an individual living in a society with a lower average health than himself (i.e. $h_i > \mu_i(\mathbf{h_{-i}})$) the RHS of equation (9) is positive like the LHS implying that the factor in square brackets is positive. If we divide by that factor and express income in real term ($y_i = Y_i/p_2$) and $p = p_1/p_2$ and express it in terms of health, we get

$$\frac{\alpha_{i1}}{\alpha_{i2}}\cdot\left(\frac{\theta_{i1}y_i}{h_i + e_i} - p\right)^{1-\rho_i} = p + \frac{\beta_i[(1-\gamma_i)\sigma_i^o + \gamma_i e^{-\kappa(h_j-\mu_i)^2/2}](h_i - \mu_i)}{1-\beta_1[(1-\gamma_i)\sigma_i^o + \gamma_i e^{-\kappa(h_j-\mu_i)^2/2}](h_i+e_i)(h_i-\mu_i)}\cdot\theta_{i1}y_i \tag{10}$$

Proposition 2.1. *Health of an individual living in a society unhealthier than himself (i.e. $h_i > \mu_i(\mathbf{h_{-i}})$) is decreasing in social sensitivity (κ_i and γ_i) and in the preference for unhealthy consumption (α_{i1}/α_{i2}).*

Proposition 2.1 shows that if others' health is low and the individual is sufficiently socially sensitive then he may choose a consumption bundle that leads to a low own health. Intuitively the speed and magnitude of convergence will depend on the relative weight that individual has on the social component of their fitness sensitivity (i.e. γ_i) and on their sensitivity toward deviation of peer's health with respect to his (i.e. κ_i). In addition to this, such convergence, depends also on the relative taste that individual has regarding unhealthy

consumption (α_{i1}/α_{i2}) i.e. individual are allowed to have heterogeneous assimilation rate depending on the type of unhealthy good considered.

3 Data

We collected individual-level data from the Integrated Health Interview Survey (IHIS), which is a harmonized dataset for over 50 years (1963-2014) collected by the National Health Interview Survey (NHIS). In this paper, we used a sub-set of the IHIS, going from 1989 to 2014, when the information on the number of years spent in the US was collected. Following similar literature (Antecol and Bedard, 2006, Borjas, 2015, Giuntella and Stella, 2016) and to ensure the representativeness of the sample we restricted the observations to individual aged 25-65 years that migrated to the US after the age of 18 years. We consider several dependant variables. The first two are two dummy variables coded one if the individual is a smoker or a binge drinker. Following the guidelines from the National Institute of Alcohol Abuse and Alcoholism (NIAAA) binge drinking is defined as *"... a pattern of drinking that brings blood alcohol concentration (BAC) levels to 0.08 g/dL; this typically occurs after 4 drinks for women and 5 drinks for men"*. Therefore, a binge drinker is a man consuming more than 5 drinks a day, or a woman consuming more than 4 drinks. The other two variables are continuous variable measuring the number of cigarettes and alcoholic beverages[2] that the individual is consuming on a daily basis[3]. We excluded from the sample any observation with missing data for drinking, smoking, age, years since migration, year of arrival, years of education and current employment and marital status. After such restriction, we have a final sample consisting of: 669,445 US natives (548,853 White people, 23,753 Hispanics and 99,226 Black people) and 42.558 immigrants (27,330 White people, 23,420 Hispanics and 4.142 Black people).

[Table 1 about here.]

[Table 2 about here.]

In Table 1 and 2 we report the descriptive statics for our final sample divided for men and women and stratified by ethnicity and citizenship. Native men and women have higher education attainment (13.3 years of education) with respect to immigrants (12 years); they are more likely to be married (63% for natives versus 62% for immigrants); natives are also more likely to work (especially women). Regarding drinking habits the rate of binge drinking is slightly higher for immigrants with respect to natives (11% versus 10%), mostly due to white immigrants binge drinker (13% versus 10%). Natives women have a higher probability of being binge drinker than immigrants (6% versus 2.5% and 1.2 drinks versus 0.6), such difference is more pronounced for Hispanic ethnicity (10% versus 3%). The striking finding is that native men and women have

[2]Alcoholic beverages include liquor, beer, wine, wine coolers, and any other type of alcoholic beverage

[3]Since the IHIS codebook exercise caution in interpreting very high values for drinking habits we dropped any observation reporting more than 20 drinks per day, as they may have misunderstood the question (e.g., they may have given a response related to the number of days that they drank or related to a different reference period, such as the number of drinks per year).

a greater chance of being smoker than their immigrant counterparts (30% versus 20% for men; 24% versus 9% for women). If we compare the number of cigarettes daily consumed, native men and women consumes a striking higher number of cigarettes with respect to natives (5 cigarettes versus 2 for men; 3 versus less than 1 for women). From Table 1 and 2 it is easy to see that such relationship are the same for all ethnic group considered.

4 Empirical Framework

In order too investigate cohorts' differences in the level of immigrant drinking and smoking habits upon arrival in the US and in the rate of growth of immigrant assimilation, we employ a linear probability model similar to Borjas (2015), Giuntella and Stella (2016). Such model allows for the presence of cohort differences in the rate of assimilation.

Following the empirical methodology from Borjas (2015), Giuntella and Stella (2016), we consider the following model

$$B_i = \delta A_i + \gamma C_i + \theta(A_i \cdot C_i) + \beta X_i + \epsilon_i \tag{11}$$

where the unit of observation is individual i aged 25-64 years at time of the IHIS interview. B_i represents the outcome of interest (e.g. binge drinking, smoking), X_i is a vector of control variables including age (introduced as a third-order polynomial) interacted with a variable indicating whether the person is foreign- or native[4]; A_i is linear variable indicating the number of years the immigrant has lived in the US (equal to 0 for natives); C_i is a vector of dummy variables identifying immigrant arrival cohorts (i.e. cohort fixed effects), with the omitted category given by comparable natives. Following the novelty introduced by Giuntella and Stella (2016) we include in (1) the factor $A_i \cdot C_i$, which represents the interaction between the linear term of the years-since-migration and each cohorts fixed effects. Such term allows us to control for the fact that each arrival cohort has its own growth path regarding B_i. In this way we can examine the differential assimilation pattern that the different immigrant-arrival cohorts exhibit.

In equation (1) the δ coefficient represents the effect of assimilation on the specific health behavior of interest, while the γ coefficient indicates whether upon their arrival in the US immigrants were more or less likely to engage in unhealthy behaviors with respect to otherwise similar native[5].

As in Borjas (2015) in addition to the regression analysis we also report the relative unhealthy behavior growth rates in the first 10 years after immigration[6]. Such analysis is intended to illustrate the trends in the rate of unhealthy assimilation, by computing the extend to which the health gap between natives and

[4]This is the same set of controls used by Giuntella and Stella (2016) and Borjas (2015).

[5]Since the immigrant's year of arrival is defined as the difference between the survey year and the years since migration to the US. However, given that the years since migration, in the IHIS dataset is reported as a categorical variable with five intervals (i.e. 0-1, 1-4, 5-9, 10-14 and 15+), to construct a continuous variable for the year of arrival, we used the mid point for each interval of years since migration. The interval 15+ is coded as 29 years.

[6]The 10-year growth in the relative incidence of unhealthy behaviors of immigrants is calculated by computing immigrant and native incidence rates both at the time of entry, assuming it occurred at 25 years old and 10 years later.

immigrants narrowed over the first decade in the US[7].

5 Result

We estimate equation (1) using ordinary least squares (OLS) of the linear probability model, using the pooled data from the whole sample. We also estimated the average marginal effect from a Probit regression, yielding similar results. Such results are available upon request. Tables 3 to 6 present the results for the various models and the different health variables considered. The upper part (panel (a)) of each table presents the immigrant arrival cohort fixed effects identifying cohorts differences in alcohol and smoking status between immigrants, at the time of their entry, and comparable American natives. The lower part (panel (b)), instead, provides the interactions between cohorts fixed effect and the number of years since migration. This part is developed following Borjas (2015), the interactions are meant to describe the amount of convergence across different immigrant cohorts over their first 10 years in the US.

We estimate equation (1) for the whole sample (columns (1)), dividing by gender (columns (2) for male and (3) women) and ethnic origin (columns (4) for Hispanic people, (5) for White people and (6) for Black people). In this way we can analyze the rate of assimilation of a given immigrant sub-group over their native counterpart, with no base group set. We will present the results for the sample as a whole and, if present, we will describe different patter for different gender or ethnic origins[8].

[Table 3 about here.]

[Table 4 about here.]

Table 3 presents the results on the probability of being a binge drinker, the cohort effects are uniform, significantly negative and smaller, in absolute term, for recent arrival cohorts. These results support the evidence of the healthy immigrant effect, with recent cohorts having a higher probability of being binge drinker than the earlier ones. The initial entry level of binge drinking of immigrants who arrived before 2000 was 8% lower than that of natives, while the initial entry level of immigrant arriving between 2005 and 2014 is 6% lower than that of natives. In general, similar patterns are found by gender and ethnic groups, with the only exception of women and Black (columns (3) and (6)). While for male immigrant and Hispanic (columns (2) and (4)), by far the largest immigrant ethnic group in the US, the entry level declines from 11% to 5% and from 3% to less than 1% (although not statistically significant) respectively. In panel (b) of table 3, the rates of assimilation from the whole sample (column 1) show that the estimated coefficient are positive, increasing and significant. The coefficients increase with more recent arrival cohorts. The rates of assimilation significantly increase for cohorts arrived after 1995. Before 1995, immigrants could expect

[7] To construct these interactions, we follow Borjas (2015).

[8] We also estimated the same regression including controls for years of education, marital and employment status, and the yield the similar results, since the inclusion of such control might better represent the different economic context in which immigrants live. Years of education has a protective effect reducing the rate of consumption of alcohol and cigarettes. Such results are available upon request.

an increase in their relative binge drinking rate of 3 to 5-percentage points in the first ten years in the US. Immigrants arrived after 1995, instead, could expect an increase of almost 5-percentage point. This increase in the rates of assimilation for the whole sample is mainly driven by Hispanic and male sub-samples (column (2) and (4)), for whom the increase is particularly pronounced.

Table 4 presents the results for the number of alcoholic drinks daily consumed. On average immigrants arrived after 2000 consumed a little bit more than half a drink less per day than natives, while from 1985 to 1990 they consumed almost a full drink less. In general the results are comparable to the one for binge drinking, although the assimilation rates actually decreased for later cohorts, especially from 1995 onwards, when the increases in binge drinking assimilation was higher. This results point out to the fact that later cohorts are more prone in becoming binge drinker although consuming less alcoholic beverages (on average) with respect to natives. Such pattern could be easily reconciled with the slower economic assimilation that later cohorts have (Borjas, 2015) which is limiting their possibility to purchase higher doses of alcoholic beverages.

[Table 5 about here.]

[Table 6 about here.]

Table 5 presents the results for smoking rate. In the upper part, we notice that later immigrants cohorts are actually less likely to smoke, particularly after 1995. The initial entry level of smoking rate of immigrants who arrived before 1995 was 7% lower than that of natives, while the initial entry level of immigrant arriving between 1995 and 2014 increased to 16%. In general, similar patterns are found by gender and ethnic groups, with the only exception of Black people (column (5)) which saw a slight decrease after 1995 (from 9% to 7%)). From the lower panel of Table 5 we notice that the assimilation rates are negative and significant. This means that immigrants are actually diverging from natives' smoking rates over time, a sort of de-assimilation. However such divergence is decreasing over time. Such de-assimilation significantly decreased, in absolute term, for cohorts arrived after 2000, prior to that time immigrants could expect to have a decrease in their relative smoking rate of more than 10-percentage point on average in the first ten years in the US. Immigrant arrived after 2000, instead, could expect a sharp reduction in this rate to less than 1-percentage point. Such general trend is mainly influenced by the rate of de-assimilation of White and male immigrants (columns (2) and (4)), for which the increase is particularly pronounced, such that it turned positive (i.e. assimilation) after 2000. This means that later immigrant cohorts arrive with lower smoking rates, but as they spent time in the US, especially if they are male and/or White, the probability of maintaining such health advantages decreases.

Table 5 presents the results for the number of cigarettes consumed daily. On average immigrant arrived after 2000 consumed 2 cigarettes less than their American counterpart, while before that time less than one. In general, the results are similar to the one for smoking rates, with sharp changes in the de-assimilation rates after 2000, similarly to the one for smoking rates, especially for male and Hispanic (columns (2) and (4)).

6 Conclusion

In this paper we study immigrant long-term trend of assimilation of binge drinking and smoking habits from American native. To do so we use data from the Integrated Health Interview Survey (1989-2014). We find that not only there are cohort differences in alcohol consumption and smoking rates of immigrants once they arrive in the US, but also in their assimilation of such behaviors as time passes. Recent cohorts exhibit lower differences in drinking habits with respect to natives and faster assimilation. While for smoking recent cohorts report lower smoking habits, however such relative advantage seems to be decreasing with time spent in the US, both in term of smoking rates and number of cigarettes. Especially Hispanic and male immigrants are the one in greater risk of assimilating both unhealthy behaviors. Overall our results provide evidence that there is heterogeneity in how immigrants assimilate unhealthy behaviors from natives. For drinking the convergence towards American rates seems to start in the home countries and continues the longer they stay in the US; while for smoking habits immigrants' relative advantage is present and stronger over-time as they leave their home countries, however the longer they stay in the US the more they are influenced by natives' habits.

Unfortunately due to limitation in the data (e.g. country of migration, area of migration, reference peers) we can only speculate on the specific drivers behind these assimilation patterns. One possible explanation is related to social norms and peers effects toward which immigrants are exposed once they arrive in the US, with this effect being more pronounced among second-generation immigrants (Ali and Dwyer, 2009, Gaviria and Raphael, 2001, Powell et al., 2005). Another possible explanation is the slower economic assimilation that new immigrants experience (Borjas, 2015), causing them to be at higher risk of experiencing unhealthy behaviors. There is indeed space for future research is the direction of such assimilation in order to promote ways to sustain healthy behaviors among immigrant and their descendants.

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Table 1: Summary statistics for men, by nativity and ethnic origin

	All Origin		Hispanic		White		Black	
	(1) Native	(2) Immigrant	(3) Native	(4) Immigrant	(5) Native	(6) Immigrant	(7) Native	(8) Immigrant
Binge Dr.	0.10	0.11	0.19	0.16	0.10	0.13	0.07	0.05
Smoking	0.28	0.19	0.26	0.20	0.27	0.21	0.32	0.14
N. of drinks (Daily)	1.87	1.89	2.77	2.30	1.92	2.12	1.55	1.35
N. of cigarettes (Daily)	4.71	1.98	2.69	1.79	4.90	2.16	3.82	1.43
Age	44.00	43.93	40.39	43.47	44.08	44.36	44.05	44.63
Married	0.57	0.65	0.50	0.65	0.60	0.65	0.40	0.54
Education (Years)	13.54	12.24	12.87	10.30	13.66	11.41	12.78	13.21
Employed	0.81	0.82	0.80	0.82	0.83	0.82	0.70	0.82
Before 1970		0.04		0.04		0.04		0.03
1970-80		0.21		0.21		0.23		0.20
1980-85		0.18		0.17		0.18		0.20
1985-90		0.06		0.07		0.06		0.06
1990-95		0.11		0.11		0.11		0.10
1995-00		0.19		0.20		0.19		0.20
2000-05		0.13		0.14		0.13		0.13
2005-14		0.08		0.05		0.06		0.07
Less than 1 year		0.02		0.02		0.02		0.01
1-5		0.17		0.15		0.15		0.15
5-9		0.21		0.22		0.20		0.22
10-14		0.18		0.20		0.18		0.20
15+		0.42		0.41		0.44		0.41
Observations	146923	17847	9357	9740	122266	11438	20282	1763

Table 2: Summary statistics for women, by nativity and ethnic origin

	All Origin		Hispanic		White		Black	
	(1) Native	(2) Immigrant	(3) Native	(4) Immigrant	(5) Native	(6) Immigrant	(7) Native	(8) Immigrant
Binge Dr.	0.06	0.03	0.10	0.03	0.06	0.03	0.04	0.02
Smoking	0.24	0.09	0.19	0.09	0.24	0.11	0.24	0.05
N. of drinks (Daily)	1.18	0.66	1.49	0.65	1.23	0.74	0.92	0.57
N. of cigarettes (Daily)	3.32	0.81	1.65	0.67	3.55	1.02	2.44	0.39
Age	43.75	44.39	39.97	43.95	44.05	44.80	42.90	44.85
Married	0.53	0.59	0.45	0.56	0.60	0.58	0.27	0.42
Education (Years)	13.53	11.91	12.77	10.37	13.67	11.25	12.97	12.60
Employed	0.69	0.57	0.67	0.52	0.70	0.54	0.65	0.70
Before 1970		0.04		0.04		0.05		0.04
1970-80		0.22		0.23		0.24		0.21
1980-85		0.18		0.16		0.18		0.19
1985-90		0.07		0.08		0.06		0.06
1990-95		0.12		0.13		0.12		0.11
1995-00		0.18		0.19		0.18		0.18
2000-05		0.13		0.13		0.13		0.13
2005-14		0.07		0.04		0.05		0.07
Less than 1 year		0.02		0.01		0.01		0.02
1-5		0.15		0.13		0.13		0.14
5-9		0.22		0.23		0.22		0.22
10-14		0.19		0.20		0.19		0.20
15+		0.43		0.42		0.45		0.42
Observations	171890	21630	12714	12105	135552	13997	31205	2048

Table 3: Linear probability model model allowing for cohort effects in binge drinking

	All Origin			Hispanic	White	Black
	(1) All	(2) Male	(3) Female	(4) All	(5) All	(6) All
(a) Cohort Effects:						
1985-90	-0.0797***	-0.114***	-0.0530***	-0.0461***	-0.0685***	-0.0440**
	(0.00860)	(0.0161)	(0.00494)	(0.00407)	(0.0104)	(0.0115)
1990-95	-0.0870***	-0.0786**	-0.0884***	-0.0950***	-0.101***	-0.0284*
	(0.00891)	(0.0161)	(0.00547)	(0.00394)	(0.0107)	(0.0101)
1995-00	-0.0787***	-0.0727**	-0.0920***	-0.0633***	-0.0675***	-0.0369**
	(0.00907)	(0.0167)	(0.00565)	(0.00399)	(0.0106)	(0.00925)
2000-05	-0.0738***	-0.0613**	-0.0974***	-0.0344***	-0.0612***	-0.0282*
	(0.00920)	(0.0170)	(0.00567)	(0.00411)	(0.0107)	(0.00999)
2005-14	-0.0604***	-0.0507*	-0.0830***	-0.00853	-0.00186	-0.0517***
	(0.00904)	(0.0169)	(0.00558)	(0.00451)	(0.0108)	(0.0101)
(b) Relative growth in the first 10 years:						
1985-1990 arrivals	0.0338***	0.0878***	0.0057	0.00142	0.0459***	0.0004
	(0.0023)	(0.0015)	(0.3055)	(0.8311)	(0.0055)	(0.2587)
1990-1995 arrivals	0.040***	0.0484***	0.0292***	0.0322***	0.0604***	0.005
	(0.0033)	(0.0305)	(0.0007)	(0.0005)	(0.0012)	(0.6717)
1995-2000 arrivals	0.0429***	0.0549**	0.0366***	0.0159**	0.0475***	0.103
	(0.0024)	(0.0191)	(0.0002)	(0.0187)	(0.0044)	(0.3686)
after 2000 arrivals	0.0463***	0.0674***	0.0408***	0.0376***	0.0563***	0.0116
	(0.0015)	(0.0073)	(0.0000)	(0.0002)	(0.0019)	(0.4201)
Observations	358276	164761	193515	43914	283245	55294

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4: Linear probability model model allowing for cohort effects in number of drinks

	All Origin			Hispanic	White	Black
	(1) All	(2) Male	(3) Female	(4) All	(5) All	(6) All
(a) Cohort Effects:						
1985-90	-0.697***	-0.433**	-0.993***	-0.760***	-0.623***	-1.020***
	(0.0631)	(0.108)	(0.0653)	(0.0582)	(0.0508)	(0.0871)
1990-95	-0.882***	-0.594***	-1.023***	-1.061***	-0.968***	-0.624***
	(0.0654)	(0.106)	(0.0702)	(0.0530)	(0.0494)	(0.0824)
1995-00	-0.722***	-0.481**	-1.065***	-0.825***	-0.649***	-0.296**
	(0.0667)	(0.109)	(0.0719)	(0.0498)	(0.0485)	(0.0758)
2000-05	-0.625***	-0.378**	-1.027***	-0.556***	-0.523***	-0.391**
	(0.0677)	(0.111)	(0.0722)	(0.0499)	(0.0492)	(0.0828)
2005-14	-0.543***	-0.413**	-0.866***	-0.0298	-0.187**	-0.358**
	(0.0666)	(0.110)	(0.0706)	(0.0493)	(0.0494)	(0.0801)
(b) Relative growth in the first 10 years:						
1985-1990 arrivals	0.122	0.088	0.231**	0.0504	0.216**	0.439***
	(0.1236)	(0.5110)	(0.0124)	(0.5694)	(0.0125)	(0.0023)
1990-1995 arrivals	0.236**	0.194	0.209**	0.222**	0.409***	0.0857
	(0.0111)	(0.1582)	(0.0212)	(0.0215)	(0.0002)	(0.4077)
1995-2000 arrivals	0.181**	0.140	0.301***	0.147*	0.224***	0.0357
	(0.0357)	(0.2979)	(0.0032)	(0.0850)	(0.0062)	(0.7099)
after 2000 arrivals	0.175**	0.183**	0.265***	0.0573	0.227***	0.247**
	(0.0543)	(0.0203)	(0.0068)	(0.4769)	(0.0000)	(0.0446)
Observations	358034	164553	193481	43867	283051	55263

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5: Linear probability model model allowing for cohort effects in smoking habits

	All Origin			Hispanic	White	Black
	(1) All	(2) Male	(3) Female	(4) All	(5) All	(6) All
(a) Cohort Effects:						
1985-90	-0.0479***	-0.0886***	-0.00532	-0.0872***	-0.109***	-0.0762**
	(0.00908)	(0.0171)	(0.00765)	(0.0117)	(0.00680)	(0.0226)
1990-95	-0.0653***	-0.00845	-0.0977***	-0.0507**	-0.0653***	-0.142***
	(0.00840)	(0.0158)	(0.00731)	(0.0120)	(0.00639)	(0.0204)
1995-00	-0.0718***	-0.0276	-0.123***	-0.0554**	-0.0516***	-0.0905**
	(0.00814)	(0.0159)	(0.00708)	(0.0120)	(0.00619)	(0.0190)
2000-05	-0.111***	-0.100***	-0.135***	-0.0593**	-0.106***	-0.0664*
	(0.00818)	(0.0159)	(0.00711)	(0.0122)	(0.00627)	(0.0208)
2005-14	-0.156***	-0.147***	-0.182***	-0.121***	-0.174***	-0.0663*
	(0.00785)	(0.0155)	(0.00679)	(0.0125)	(0.00617)	(0.0209)
(b) Relative growth in the first 10 years:						
1985-1990 arrivals	-0.1436***	-0.116***	-0.159***	-0.167***	-0.111***	-0.0653*
	(0.0000)	(0.0008)	(0.0000)	(0.0001)	(0.0000)	(0.0636)
1990-1995 arrivals	-0.0630***	-0.0559**	-0.0816***	-0.0250	-0.0441***	-0.0769**
	(0.0005)	(0.0299)	(0.0000)	(0.1340)	(0.0009)	(0.0185)
1995-2000 arrivals	-0.0833***	-0.0845***	-0.0751***	-0.0252***	-0.0909***	-0.0215
	(0.0001)	(0.0038)	(0.0000)	(0.0082)	(0.0000)	(0.3971)
after 2000 arrivals	-0.0172***	0.0487**	-0.0396***	-0.0449**	0.0416***	-0.0869***
	(0.1194)	(0.0436)	(0.0014)	(0.0191)	(0.0009)	(0.0039)
Observations	327600	150107	177493	47108	256269	51398

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 6: Linear probability model model allowing for cohort effects in number of cigarettes

	All Origin			Hispanic	White	Black
	(1) All	(2) Male	(3) Female	(4) All	(5) All	(6) All
(a) Cohort Effects:						
1985-90	-0.0537	-0.463	-0.418***	-1.114***	-0.588**	-1.317***
	(0.114)	(0.236)	(0.0646)	(0.106)	(0.139)	(0.208)
1990-95	-0.844***	-0.540*	-0.953***	0.133	-0.821***	-1.416***
	(0.114)	(0.229)	(0.0631)	(0.106)	(0.149)	(0.172)
1995-00	-0.895***	-0.558*	-1.343***	-0.110	-0.692**	-0.913***
	(0.115)	(0.236)	(0.0617)	(0.104)	(0.152)	(0.154)
2000-05	-1.641***	-1.846***	-1.590***	-0.315*	-1.706***	-0.823**
	(0.117)	(0.239)	(0.0619)	(0.106)	(0.155)	(0.166)
2005-14	-2.163***	-2.421***	-2.088***	-0.889***	-2.417***	-0.873***
	(0.114)	(0.235)	(0.0593)	(0.108)	(0.157)	(0.156)
(b) Relative growth in the first 10 years:						
1985-1990 arrivals	-2.371***	-2.531***	-2.110***	-1.587***	-2.749***	-0.264
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.3496)
1990-1995 arrivals	-1.876***	-2.117***	-1.756***	-1.054***	-1.912***	-0.370
	(0.0000)	(0.0001)	(0.0000)	(0.0001)	(0.0000)	(0.1541)
1995-2000 arrivals	-2.130***	-2.479***	-1.720***	-1.125***	-2.447***	-1.064***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	0.0000()	(0.0011)
after 2000 arrivals	-1.621***	-1.320***	-1.230***	-0.793***	-1.173***	-1.261***
	(0.0000)	(0.0016)	(0.0000)	(0.0004)	(0.0002)	(0.0004)
Observations	327600	150107	177493	47108	256269	51398

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$